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10/667,951	09/22/2003	Kyle R. Johns	MS1-1705US	1221

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EXAMINER	
CHAUHAN, LOREN B	
ART UNIT	PAPER NUMBER
2193	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,951	JOHNS ET AL.	
	Examiner	Art Unit	
	Loren Chauhan	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4, 6-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to RCE filled on 7/16/2008. Claims 1, 9 and 18 have been amended. Claims 1-4 and 6-20 are pending for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 6-7, 9-15 and 17-20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Advani (US Pat. No. 5,862,381) in views of Mills (US Pat. No. 6,055,560) further in view of Brown (US Pat. No. 6,631,423).

4. As per claims 1, 9 and 18 Advani teaches the invention substantially as claimed including a method for controlling presentation of information to facilitate performance analysis for processing (col. 1, lines 5-9, 54-55), the method comprising:

capturing a list of events during processing of a set of commands by a processing unit; displaying a listing of the captured events as well as information regarding the processing of the events (col. 1, lines 18, 24-42, col. 3, lines 29-31, col. 10, lines 43-45);

receiving a user selection of one of the events of the listing; executing commands associated with the selected event in the processing unit (fig. 6B, 6C, col. 9, lines 53-63, col. 10, lines 6-8, col. 7, lines 60-62).

5. Advani teaches to produce multiple windows and since data is available (collected and stored), it is just a matter to sort/called to produce desire display (col. 7, lines 65-67). Therefore Advani inherently teaches the second window that shows how the frame appears at different points while being drawn.

6. Advani does not explicitly teach capturing the state of the graphics processing unit for each of the captured events; modifying selected events; setting the state of the graphics processing unit to the captured state associated with the selected event; and displaying in the video frame portion a visual representation of the frame resulting from the execution of the selected event.

7. Brown teaches capturing the state of the graphics processing unit for each of the captured events (col. 12, lines 43-46); modifying selected events (col. 13, lines 60-65); setting the state of the graphics processing unit to the captured state associated with the selected event (col. 4, lines 28-31). But does not explicitly teach displaying in the video frame portion a visual representation of the frame resulting from the execution of the selected event.

8. Mills teaches composing and displaying in the video frame portion a visual representation of the frame resulting from the execution of the selected event (col. 9, lines 50-57).

9. It would have been obvious to one of the ordinary skill in the art at the time of the invention was made to include capturing the state (as taught by brown) and displaying video frame portion (as taught by Mills) in Advani's system because by doing so user can quickly identify errors and anomalies that occurred during program execution and can see the effects of those error concerning to video frame on a display device.

10. As per claim 2, Advani teaches the information regarding the processing of the events comprises a value representing how long it took for processing of the events by a processing unit to finish (col. 10, lines 14-17).

11. As per claim 3, Advani teaches a timeline portion having a plurality of bars (col. 7, lines 60-62), each bar corresponding to a particular one of the events, wherein a location of each bar on the timeline indicates when the corresponding event occurred relative to the other events during processing (fig. 4A-4F, col. 7, lines 16-17).

12. As per claim 4, Advani teaches a method, further comprising:

allowing the user to select a warning window, to be displayed as the frame portion, wherein the warning window identifies violations of one or more

recommendations for programming a processing unit that processed the set of commands (col. 2, lines 61-62).

13. As per claim 6, Advani teaches the user to select one of multiple views to be displayed in the frame portion (col. 7, lines 58-60), but fails to teach the multiple views include a render target view that shows the frame as it is drawn at different chronological points while being drawn, a depth buffer view that shows a depth value for each pixel in the frame at different chronological points while the frame is being drawn, and a wireframe view that shows an outline of each triangle rendered in the frame at different chronological points while the frame is being drawn.

14. However, Advani's system has ability to view different characteristics of a trace file and different field information for each event (col. 7, lines 58-59, 65-66). It would have been obvious to one of ordinary skill in the art at the time of the invention to include "depth buffer view" and "wireframe view" in Advani's system because by doing so system is able to display different information of processor events during program execution.

15. As per claim 7, Advani teaches allowing the user to select one of multiple views to be displayed in the frame portion (col. 7, lines 57-58, col. 9, lines 10-11), but fails to show the multiple views include an overdraw view and a fill rate view.

16. However, Advani's system executing/monitoring program has ability to display simultaneously various characteristics of a trace (col. 7, lines 59-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to have overdraw view and fill rate view in Advani's system because by doing so user has ability to quickly access, easily review and understand trace file data (col. 11, lines 42-43).

17. As per claim 10, Advani teaches the first window further identifies, for each of the identified events, a value representing how long it took for drawing of the event by a graphics processing unit to occur (col. 10, lines 14-17).

18. As per claim 11, Advani teaches the one or more instructions further causes the one or more processors to:

display a third window including a timeline having a plurality of bars (col. 7, lines 60-62), each bar corresponding to a particular one of the identified events, wherein a location of each bar on the timeline indicates when the corresponding event occurred relative to the other events during drawing of the frame (fig. 4A-4F, col. 7, lines 16-17).

19. As per claims 12 and 13, they are similar to claims 6 and 7, therefore claims 12 and 13 are rejected for the same reason as per claims 6 and 7 respectively.

20. As per claim 14, Advani teaches the user to select a warning window, to be displayed as the second window, wherein the warning window identifies violations of

one or more recommendations for programming a graphics processing unit that drew the frame (col. 2, lines 61-62).

21. As per claim 15, Advani teaches the instruction causes the processor to display a pixel history window that identifies each of the events that affects a user-selected pixel of the frame (fig. 6B, 6C, col. 9, lines 52-63, col. 7, lines 60-62, col. 10, lines 6-8).

22. As per claim 17, Advani does not explicitly teach displaying a mesh debugger window that includes information about a single mesh of the frame, and a table that shows the attribute values for each vertex in the mesh as well as an output of a vertex shader program for each vertex in the mesh.

23. However, Advani discloses a window that displays various characteristics of a trace file data (col. 7, lines 59-60). It would have been obvious to one of ordinary skill in the art at the time of the invention to include vertex attribute value and output of the shader program in Advani's trace file because by doing so would increase the use of a trace file in debugging of a program (col. 1, line 30).

24. As per claim 19, Advani teaches the graphics processing unit is part of another device coupled to the system (Fig. 1).

25. As per claim 20, Advani teaches the user interface further comprises:

a timeline window including a timeline having a plurality of bars (col. 7, lines 60-62), each bar corresponding to a particular one of the identified events, wherein a location of each bar on the timeline indicates when the corresponding event occurred relative to the other events during drawing of the frame (figs. 4A-4F, col. 7, lines 16-17).

26. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Advani (US Pat. No. 5,862,381) in view of Mills (US Pat. No. 6,055,560) further in view of Brown (US Pat. No. 6,631,423) and further in view of Zatz (US Pat. No. 6,864,893).

27. As per claim 8, Advani, Brown and Mills do not teach a debugger portion that identifies a pixel shader program or vertex shader program that was executed by a graphics processing unit in drawing the frame, and further identifies input and output register values for each instruction in the shader program as it executed in drawing the selected pixel.

28. Zatz teaches pixel program that calculates pixel depth values and writes in the memory (col. 3, lines 7-8, col. 4, lines 30-33). It is obvious to one of ordinary skill in the art at the time of the invention to include a debugger view in Advani; Brown and Mills' system because by doing so user has ability to quickly identify errors and anomalies that occurred during program execution can be corrected (Advani col. 1, lines 61-62).

29. As per claim 16, is similar to claim 8, therefore, it is rejected for same reason as per claim 8 above.

Response to Arguments

30. Applicant's arguments with respect to claims 1-4 and 6-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren Chauhan whose telephone number is 571-270-1554. The examiner can normally be reached on Mon.-Thr. 9:30-5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis Bullock can be reached on 571-272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lewis A. Bullock, Jr./
Supervisory Patent Examiner, Art Unit 2193

/Loren Chauhan/
Examiner, Art Unit 2193